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The Scale-Insect Fauna (*Homoptera, Coccoidea*) of the Ojców National Park  
in Poland

[Pp. 351—374, 1 text-fig.]

Fauna czerwców (*Homoptera, Coccoidea*) Ojcowskiego Parku Narodowego

Фауна кокцид (*Homoptera, Coccoidea*) Ойцовского Народного Парка в Польше

Abstract. In the course of three years' investigation carried out in the Ojców National Park a total of 53 species of scale-insects were collected, of which 11 are new to the Polish fauna. Four ecological groups of scale-insects, associated with definite plant communities, were distinguished.

INTRODUCTION

In 1966—1968 an investigation on the scale-insect fauna was carried out in the Ojców National Park (O.N.P.), as a part of studies covering the whole range of the Cracow-Częstochowa Uplands. The great differentiation of relief and microclimates and the opulence of plant cover of the O.N.P., as well as the fact that only 8 species of scale-insects have hitherto been recorded from this region (KAWECKI, 1935), induced us to give it a separate paper.

At present, 53 species of scale-insects, of which 11 new to the Polish fauna, have been found in this area. The large number of scale-insects (more than 50% of the species published from Poland) occurring in this relatively small area is presumably due to the above-mentioned specific nature of the territory.

The host plants have been determined by Dr E. KOTEJA. The work has been performed in the Department of Zoology, College of Agriculture, Cracow.

## CHARACTERISTICS OF THE REGION

The Cracow-Częstochowa Uplands are a large rocky ridge stretching from the forefield of the Carpathians in the south to the Częstochowa and Wieluń Districts in the north. The O.N.P. lies in the southern part of the Uplands 22 km north-west of Cracow. It is oriented meridionally and occupies an area of 1570 hectares, 11 km. long and 0.2—4.0 km. wide (GOTKIEWICZ and SZAFER, 1956). The O.N.P. extends from Pieskowa Skała in the north to the mouth of the Korytania Gorge in the south.

This region includes several valleys, of which the Prądnik and Sąspowska Valleys are the largest, and gorges, such as Korytania, Za Bramą Krakowską, and Jamki. The valleys (DRZAŁ, 1954) cut into the thick formations of Upper Jurassic limestone, producing picturesque forms of rocks. The limestones outcrop mostly in the valley walls and the upland is covered with a thick layer of loess, out of which relict rocks jut at places. The valley floors are flat; in the places where the stream washes the toes of rocks there is a distinct angle between the river-terrace and the rocky valley wall, otherwise screes are formed at the foot of the slopes owing to the crumbling of rocks, and they blur the boundary between the valley floor and wall. A distinctive feature of the valleys is the asymmetry of their slopes. Nearly all the eastern slopes are rocky and steep and the western ones slant more gently, being covered with a thick layer of loess. The highest elevation of the upland, near Czajowice, reaches 478 m. a.s.l., whereas the altitude of the lowest point, in the Prądnik Valley, below the entrance to the Korytania Gorge, is 305 m.

Geologically, the main stretch of the region is built of the Upper Jurassic beds of limestone and Pleistocene clays and loesses (ALEXANDROWICZ and WILK, 1962).

The Stream Prądnik flows in the floor of the Prądnik Valley and the Sąspówka in the Sąspowska Valley. There are no permanent streams in the side valleys and gorges, in which water appears periodically. This is due to the limestone and karst nature of the region. Karst processes occurred and are still occurring in this complex of Jurassic limestones, giving rise to valleys with steep slopes, undrained funnel-like depressions, springs rich in water, and numerous caves.

The basic types of soils in this area are brown, podzol, and limestone soils. The limestone soils occur chiefly on the slopes, the brown soils on the slopes and floor of the valleys and the podzol soils on slightly sloping or flat parts of the upland.

Owing to the rich relief of the region the climate of the O.N.P. is very much differentiated. The average climatic data (MEDWECKA-KORNAŚ and KORNAŚ, 1964a) calculated for the whole region are as follows: mean annual temperature about 8°C, mean July temperature 18°C, mean January temperature -3°C, mean annual rainfall 700 mm.

Microclimatic studies (KLEIN et al., 1965) made it possible to distinguish 4 main regions in the O.N.P.:

I. The cool region of valley floors, characterized by its great daily amplitude of temperatures (exceeding that in the upland by up to 5°C), temperature lower than in the upland (up to 9°C), high humidity (up to 30% higher than that in the upland), and low rainfall (up to 80 mm. less than in the upland).

II. The cold region of valley slopes with N, NE, and NW exposures, having a low temperature (2—6°C lower than that on the southern slopes) and high humidity (10—20% higher than on the southern slopes).

III. The warm region of valley slopes with S, SW, and SE exposures, marked by its intense insolation (up to 30% higher than that in the upland) and low humidity. It may be divided into two variants: a) a warm variant (forests and brushwoods) and b) a very warm one (xerothermic epilithic swards).

IV. The temperature region of flat upland areas, showing the greatest stability of temperature and humidity, has two variants, a silvan and a woodless (cultivated fields).

About 840 species of vascular plants, forming several dozens plant communities (MEDWECKA-KORNAŚ and KORNAŚ, 1964b), occur in the area of the O.N.P.

A. The greatest part of the O.N.P. is occupied by the forest and brushwood communities, which include

- a. riverside forest (*Alno-Padion*),
- b. elm carr (*Ficario-Ulmetum*),
- c. mixed deciduous forest (*Tilio-Carpinetum*),
- d. beech forest (*Fagetum carpaticum*),
- e. sycamore maple forest (*Phyllitido-Aceretum*),
- f. xerothermic brushwood (*Corylo-Peucedanetum cervariae*), and
- g. mixed acidophilous forest (*Pino-Quercetum*).

B. The felled forest communities of the O.N.P. are of minor importance; they occur in clearings.

C. The most interesting communities of the O.N.P. are the epilithic and xerothermic ones:

- a. bryophytic communities on shady rocks (*Ctenidietalia*),
- b. epilithic tuft grass association (*Festucetum pallentis*), and
- c. *Origano-Brachypodietum pinnati* prov. community of xerothermic forbs.

D. The aquatic and riverside communities are poorly developed, which fact is due to the hydrographic conditions of the O.N.P.

E. The meadow and pasture communities are as follows:

- a. moist meadows (*Caltion*),
- b. fresh meadows (*Arrhenatheretum elatioris*),
- c. rich pastures (*Lolio-Cynosuretum*), and
- d. poor pastures (community of *Agrostis vulgaris*).

F. The cultivated field communities (*Secalino-Violetalia arvensis*) develop in fields and in the vicinity of farmhouses, etc.



The plant communities listed above, as a rule, occur in four sets of habitats corresponding to the microclimatic regions.

Meadows, pastures, cultivated fields and fragments of riverside and mixed deciduous forests occur on the valley floors. The northern slopes of the valleys and gorges are overgrown by forests and brushwoods, beech forests and sycamore maple ones being prevalent. Mixed deciduous forests occur on the slopes with other exposures and there are thermophilous brushwoods and epilithic swards on rocks and scree. Mixed forests, in which the fir or pine predominates and the beech is present, grow in the upland.

Zoologists have been concerned with this region for a long time. The following older faunistic studies are worthy of being mentioned: a catalogue of insects worked out by WAGA (1855), a survey of beetles (EICHLER, 1914), a study on snails (POLIŃSKI, 1914), and a list of butterflies (BIEŻANKO, 1923). Out of the recent publications one should mention the papers on mining insects (BEIGER, 1960), centipedes (KACZMAREK, 1964) and springtails (SZEPTYCKI, 1967), as well as those on the composition and abundance of the invertebrate community of a beech forest (KĄZMIERCZAK, 1967) and meadows (KOSIOR, 1967). Besides some notes on the appearance of different animals in the O.N.P. can be found in publications concerning the fauna of the environs of Cracow.

#### CHARACTERISTICS OF THE SCALE-INSECT FAUNA

So far, 97 scale-insect species, exclusive of greenhouse species, have been recorded from the territory of Poland. Sixty species have been collected in the O.N.P. and 53 of them identified and discussed in the present work. These scale-insects belong to the following families: *Ortheziidae* (3), *Margarodidae* (2), *Pseudococcidae* (14), *Eriococcidae* (10), *Kermococcidae* (1), *Asterolecaniidae* (2), *Coccidae* (13) and *Diaspididae* (8). Eleven species are new to the Polish fauna: *Chaetococcus sulci*, *Chnaurococcus subterraneus*, *Euripersia europaea*, *Greenisca gouxii*, *Lecanopsis festucae*, *L. formicarum*, *Metadenopus festucae*, *Parafairmairia gracilis*, *Rhizococcus inermis*, *Rh. pseudinsignis*, *Rhodania porifera*.

We failed to identify 7 species of the families *Pseudococcidae*, *Eriococcidae* and *Coccidae*. A few of the scale-insect species reported from the close neighbourhood of the O.N.P. (*Acanthococcus aceris*, *Gossyparia spuria*, *Luzulaspis frontalis*, *Palaeolecanium bituberculatum* and others) have not been found in the Park.

Detailed complex studies of the scale-insect fauna of definite areas have been carried out in Poland only in the Białowieża Forest (WÜNN, 1920), Lubliniec District (SZULCZEWSKI, 1931), Tatra Mts. (KAWECKI, 1938, uncompleted), Ziemia Lubuska (SZULCZEWSKI, 1950), Pieniny Mts. (ŻAK-OGAŻA and KOTEJA, 1964; KOTEJA and ŻAK-OGAŻA, 1966), and Nida Valley (KOMOSIŃSKA and POD-



SIADŁO, 1967, uncompleted). From these areas respectively 15, 20, about 20<sup>1</sup>, 23, 54<sup>2</sup>, and 13 species have been reported.

The number of species (53) collected in the O.N.P. is very high if we take into consideration the small area of this region; they form more than 50% of the total of species known from Poland.

The scanty data concerning the occurrence of scale-insects in Poland that we have at our disposal at present make a close zoogeographical analysis impossible.

In respect of their ecological requirements the scale-insects of the O.N.P. may be divided into groups, which coincide in outline with the plant communities.

A. Species associated with the epilithic tuft grass association (*Festucetum pallentis*) and the *Origano-Brachypodietum pinnati* prov. community of xerothermic forbs and xerothermic brushwoods (*Corylo-Peucedanetum cervariae*)

a. on herbs

- |                                      |                                    |
|--------------------------------------|------------------------------------|
| 1. <i>Acanthococcus greeni</i>       | 8. <i>Lecanopsis festucae</i>      |
| 2. <i>Chaetococcus sulci</i>         | 9. <i>Metadenopus festucae</i>     |
| 3. <i>Chnaurococcus subterraneus</i> | 10. <i>Ortheziola vejdvskyi</i>    |
| 4. <i>Euripersia europaea</i>        | 11. <i>Planchonia arabis</i>       |
| 5. <i>Greenisca brachypodii</i>      | 12. <i>Parafairmairia gracilis</i> |
| 6. <i>Greenisca glyceriae</i>        | 13. <i>Rhizococcus inermis</i>     |
| 7. <i>Greenisca gouxi</i>            | 14. <i>Rhodania porifera</i>       |

b. on trees and bushes

- |                             |                                 |
|-----------------------------|---------------------------------|
| 15. <i>Allococcus vovae</i> | 16. <i>Xylococcus filiferus</i> |
|-----------------------------|---------------------------------|

This is the most numerous group and, moreover, it contains 9 species new to Poland. It is difficult to decide the question whether the species listed above are associated exclusively with xerothermic epilithic vegetation. Many of them are known from only several localities, and the respective records often lack appropriate ecological data. Observations carried out in Poland and presented by other authors show that some of the species mentioned occur also in communities characteristic of sands (*Euripersia europaea*, *Metadenopus festucae*, *Rhizococcus inermis*, *Rhodania porifera*) and in steppe communities (*Planchonia arabis*). This group includes also *Greenisca glyceriae* and *Ortheziola vejdvskyi*, which out of the O.N.P. we collected in other, but always dry and exposed to the sun's rays, localities, and *Parafairmairia gracilis*, found in a peatbog (Piekelnik, Nowy Targ District, 10. 8. 1963, leg. E. KOTEJA). Some species collected in the xerothermic habitats of the O.N.P. were also present in other habitats of the same region. These are *Atrococcus cracens*, *Carulaspis juniperi*, *Ceroputo pilosellae*, *Anamaspis loewi*, *Asterodiaspis quercicola*, *Eriopeltis festucae*, *Parthenolecanium corni*, *Sphaerolecanium prunastri*.

<sup>1</sup> In his paper KAWECKI discusses only 7 species, but mentions 20.

<sup>2</sup> Inclusive of 3 species given by KOTEJA (1969) and 1 in the present publication.

B. Species occurring in meadows, pastures, at roadsides and forest edges (*Caltion*, *Arrhenatheretum elatioris*, *Lolio-Cynosuretum* and communities of *Agrostis vulgaris*).

- |                                    |                                      |
|------------------------------------|--------------------------------------|
| 1. <i>Atrococcus cracens</i>       | 8. <i>Rhizococcus herbaceus</i>      |
| 2. <i>Ceroputo pilosellae</i>      | 9. <i>Rhizococcus insignis</i>       |
| 3. <i>Eriopeltis festucae</i>      | 10. <i>Rhizococcus pseudinsignis</i> |
| 4. <i>Heterococcus pulverarius</i> | 11. <i>Trionymus perrisii</i>        |
| 5. <i>Lecanopsis formicarum</i>    | 12. <i>Trionymus tomlini</i>         |
| 6. <i>Luzulaspis luzulae</i>       | 13. <i>Saccharicoccus penium</i>     |
| 7. <i>Newsteadia floccosa</i>      |                                      |

This group is also numerous, and 3 of its species are new to the Polish fauna. No species of this group show special association with any of the plant communities mentioned, but they occur in all of them, being decidedly fewer in moist and cultivated meadows than in dry pastures. Largest numbers of scale-insects, with respect both to the number of species and to the abundance of populations, were found at roadsides, forest edges, and other similar places.

#### C. Forest species

##### a. on trees and shrubs

- |                                    |                                    |
|------------------------------------|------------------------------------|
| 1. <i>Anamaspis loewi</i>          | 6. <i>Nuculaspis abietis</i>       |
| 2. <i>Asterodiaspis quercicola</i> | 7. <i>Paroudablis piceae</i>       |
| 3. <i>Cryptococcus fagisuga</i>    | 8. <i>Physokermes hemicryphus</i>  |
| 4. <i>Kermococcus quercus</i>      | 9. <i>Physokermes piceae</i>       |
| 5. <i>Matsucoccus pini</i>         | 10. <i>Quadraspidiotus zonatus</i> |

##### b. in herb layer

- |                                  |                                      |
|----------------------------------|--------------------------------------|
| 11. <i>Luzulaspis nemorosa</i>   | 13. <i>Quadraspidiotus bavaricus</i> |
| 12. <i>Phyllostroma myrtilli</i> |                                      |

Six species of this group are associated with coniferous trees, three with oaks. Monophagous *Cryptococcus fagisuga* often occurs on beeches, *Fonscolombia fraxini* (placed in Group D) occasionally on ashes, and polyphagous species (from Group D) were sporadically encountered on other trees and shrubs, chiefly at the edge of a forest. The scale-insect fauna of the herb layer is poorly represented. *Phyllostroma myrtilli*, *Chionaspis salicis*, and *Lepidosaphes ulmi* (the last two species from Group D) occur on the bilberry, *Luzulaspis nemorosa* on *Luzula nemorosa*. It may be stated in general that the forests, which cover the greater part of the O.N.P., are almost devoid of scale-insects, and this is true of both the number of species and the abundance of their populations. This state of the fauna and the scanty data from other regions of Poland make it impossible to establish characteristic species of different forest communities, several of which have been distinguished in the O.N.P. In his paper on the springtail fauna of the O.N.P. SZEPTYCKI (1967), too, remarks on the lack of characteristic species of particular forest communities.

## D. Species inhabiting different environments

- |                                |  |
|--------------------------------|--|
| 1. <i>Carulaspis juniperi</i>  | 7. <i>Parthenolecanium corni</i>         |
| 2. <i>Chionaspis salicis</i>   | 8. <i>Phenacoccus aceris</i>             |
| 3. <i>Eulecanium coryli</i>    | 9. <i>Pulvinaria betulae</i>             |
| 4. <i>Fonscolombia fraxini</i> | 10. <i>Quadraspidiotus ostreaeformis</i> |
| 5. <i>Lepidosaphes ulmi</i>    | 11. <i>Sphaerolecanium prunastri</i>     |
| 6. <i>Orthezia urticae</i>     |  |

This group consists of species which are for the most part polyphagous and live in various, often extremely different, environments. This is especially true of such species as *Lepidosaphes ulmi*, *Chionaspis salicis*, and *Parthenolecanium corni*, which were observed both in epilythic xerothermic brushwoods and in shady forests.

## LIST OF SPECIES

Species new to the Polish fauna are marked with an asterisk (their distribution is presented in Fig. 1). Host plants have been identified on the basis of the key „Rośliny Polskie“ by SZAFER et al. (1953). Geographical names are given after the photogrammetric map „Ojców—Kraków—Wieliczka“ (tourist edition, 1:25 000, Warszawa, 1935). Localities in which close faunistic investigations were carried out (except for those in which results were negative) are marked with Roman numerals on the map in Fig. 1. In the list of scale-insects only the names of these localities are used to define the distribution of particular species. Characterized in brief, these localities are, as follows:

- Ia. Pieskowa Skała — forest, brushwood, roadside vegetation; left of the road leading to the castle.
- Ib. Pieskowa Skała, at the foot of Maczuga Herkulesa — epilithic swards, thermophilous brushwoods.
- IIa. Młynik, a slope on the left bank of the stream Prądnik — forest, xerothermic brushwoods, southern exposure.
- IIb. Młynik, a slope on the right bank of the Prądnik — moist epilithic swards, northern exposure.
- IIIa. Młynicka Valley (Valley of the Kamieniec), at the head of the valley — destroyed pasture, sward on rock debris.
- IIIb. Młynicka Valley, meadow on the valley floor, margin of a forest.
- IIIc. Młynicka Valley, at its mouth — moist meadow on the valley floor, forest margin on a southern slope, hornbeam-dominant forest.
- IVa. Grodzisko, in the fork of the roads leading to Skała and Pieskowa Skała — epilithic swards, thermophilous brushwoods, southern exposure.
- IVb. Grodzisko, a slope on the right bank of the stream Prądnik — epilithic swards and those growing on debris, xerothermic and thermophilous brushwoods, south-eastern exposure.
- IVc. Grodzisko, a slope on the left bank of the Prądnik — moist epilithic swards on slopes with northern exposure, dry ones at the top of crags.
- V. Dąbrówka — pine-dominant mixed forest.
- VI. Żłota Góra — forest, forest edge.



- VII. Ojców — moist wooded slopes on the left bank of the Prądnik, edge of a forest in the upland.
- VIIIa. Head of the Saspowska Valley — pastures, brushwoods, forest edge.
- VIIIb. Saspowska Valley — pasture on the floor of the valley.
- VIIIc. Mouth of the Saspowska Valley — edge of a forest on the left bank of the stream Saspówka, roadside brushwoods.
- IX. Forest over the Jamki Gorge — mixed forest, forest edge.
- X. Skały Panieńskie — epilithic sward, thermophilous brushwoods.
- XI. Góra Koronna and Okopy Mts. — epilithic swards, thermophilous brushwoods, mixed forest.
- XII. Za Bramą Krakowską Gorge — shade-tolerant and xerothermic epilithic swards, pine-dominant forest.
- XIII. Relict rock south of Czajowice — epilithic swards, pastures. This locality, situated beyond the boundary of the O.N.P., has been included in this study because of its interesting scale-insect fauna.
- XIV. Forest south-east of Czajowice — mixed forest, forest edge.
- XV. Forest over the Korytania Gorge — pine-dominant mixed forest, forest edge.
- XVI. Prądnik Valley, at the mouth of the Korytania Gorge — meadows on the floor of the valley, epilithic vegetation on the slopes.
- XVII. Smardzowicki Gorge — epilithic vegetation, brushwoods, forest, felling areas.
- Abbreviations: host — host plant, loc. — locality

### Family: *Ortheziidae*

#### 1. *Newsteadia floccosa* DE GEER

host: mosses and other plants; in the sod

loc.: Złota Góra, 19. 8. 1967 — ♀♀; Góra Koronna and Okopy, 7. 9. 1967 — ♀♀; Grodzisko (a), 11. 7. 1968 — ♀♀; relict rock south of Czajowice, 3. 9. 1968 — numerous ♀♀.

This is a species living in moist shady places. It is Palearctic and known from a number of localities in Poland.

#### 2. *Orthezia urticae* (L).

host: *Urtica dioica* L. and other plants

loc.: Pieskowa Skała (b), 10. 9. 1966 — larvae; Góra Koronna and Okopy, 25. 9. 1967 — ♀♀.

Palearctic species widely distributed in Poland.

#### 3. *Ortheziola vejdoskyi* ŠULC

host: mosses and other plants; in the sod

loc.: Góra Koronna and Okopy, 26. 9. 1967 — ♀♀; Grodzisko (a, b, c), 5. 7., 11. 7., and 11. 9. 1968 — ♀♀; Młynik (b), 22. 8. 1968 — ♀♀.

This species occurs on southern rocky slopes, most frequently in dry places. Recorded from the Pieniny Mts. in Poland (ŽAK-OGAŽA and KOTEJA, 1964), it is also known from a few localities in Europe.

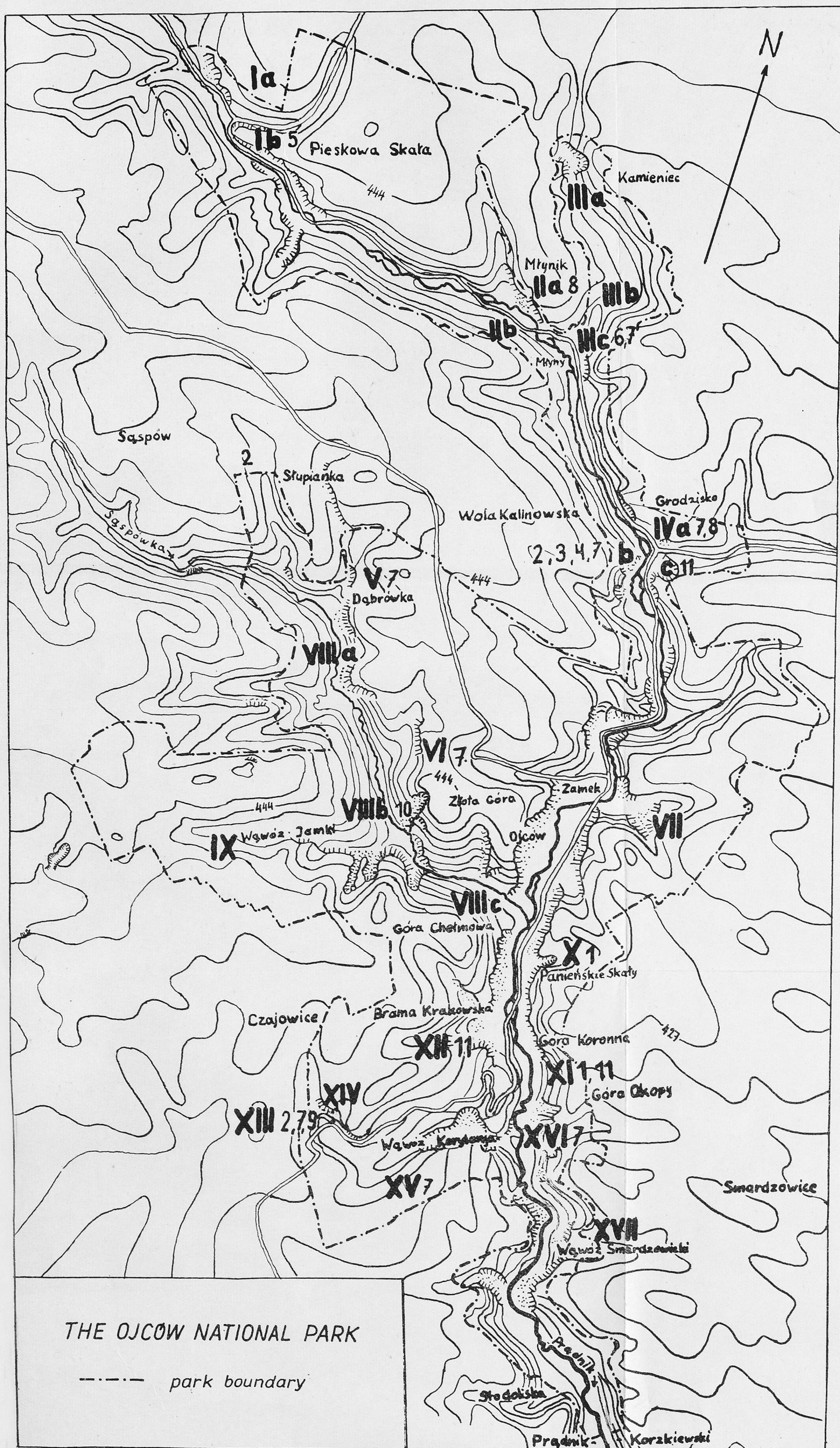


Fig. 1. Ojców National Park

Roman numerals — localities (detailed explanation in the text, on p. 357), Arabic numerals — localities of species new to the Polish fauna: 1. *Chaetococcus sulci*, 2. *Chnaurococcus subterraneus*, 3. *Euripersia europaea*, 4. *Metadenopus festucae*, 5. *Rhodania porifera*, 6. *Rhizococcus inermis*, 7. *Rhizococcus pseudinsignis*, 8. *Greenisca gouxi*, 9. *Lecanopsis festucae*, 10. *Lecanopsis formicarum*, 11. *Parafaimairia gracilis*



Family: *Margarodidae*4. *Matsucoccus pini* (GREEN)

host: *Pinus silvestris* L.

loc.: forest near Czajowice, 20. 7. 1966 — intermediate ♀♀ (exuvia); Złota Góra, 10. 9. 1966; Grodzisko, 11. 7. 1968 — intermediate ♀♀ (exuvia).

In Poland this species has been reported only by BORATYŃSKI (1960), but it was collected by the authors of the present paper in different localities of southern Poland. It lives in England, Austria (BORATYŃSKI, 1960) and in the Leningrad District (BORCHSENIUS, 1950).

5. *Xylococcus filiferus* LÖW

host: *Tilia parvifolia* EHRH.

loc.: Góra Koronna, 26. 9. 1966 — numerous larvae and young ♀♀.

It has already been recorded from this locality by KAWECKI (1935). Besides, it occurs in the Świętokrzyskie Mts. and Pieniny Mts. in Poland, and in other European localities.

Family: *Pseudococcidae*6. *Allococcus vovae* (NASSONOV)

host: *Juniperus communis* L.

loc.: Za Bramą Krakowską Gorge, 13. 7. 1966 — young ♀♀.

Species known from several localities in Poland, also present in other European countries.

7. *Atrococcus cracens* WILLIAMS

host: *Leontodon hispidus* L., *L.* sp., *Veronica chamaedrys* L., *Plantago media* L., *Achillea millefolium* L., *Trifolium* sp., and other unidentified plants

loc.: forest near Czajowice, 20. 7. 1966. — young ♀♀; Saspowska Valley, 28. 6. and 19. 8. 1967 — ♀♀; Prądnik Valley, 21. 8. 1967 — ♀♀; Młynicka Valley, 22. 8. 1968 — ♀♀; relict rock south of Czajowice, 3. 9. 1968 — ♀♀; Grodzisko (c), 11. 9. 1968 — ♀♀.

This species has already been recorded from the Pieniny Mts. (KOTEJA and ŻAK-OGAŻA, 1966) and collected in several localities in the south of Poland. It is known from Great Britain (WILLIAMS, 1962).

8. *Ceroputo pilosellae* ŠULC

host: *Thymus* sp. and other plants

loc.: Grodzisko (b), 5. 7. 1968 — 3 ♀♀ while giving birth to larvae.

Species fairly often collected in Poland and occurring in other parts of Europe.



**\*9. *Chaetococcus sulci* (GREEN)**

host: *Festuca pallens* HOST., on root necks

loc.: Skały Panieńskie, 29. 7. 1966 — larvae in various instars and ♀♀; Góra Koronna, 26. 9. 1966 and 25. 9. 1967 — larvae and ♀♀; Prądnik Valley, 7. 9. 1967 — ♀♀.

Species living in xerothermic epilithic swards. It is new to the Polish fauna, occurs in Europe and Transcaucasia (BORCHSENIUS, 1949).

**\*10. *Chnaurococcus subterraneus* (NEWSTEAD)**

host: *Festuca pallens* HOST., *Poa compressa* L., on roots

loc.: Grodzisko (b), 5. 7. 1968 — young ♀♀; relict rock south of Czajowice, 3. 9. 1968 — ♀♀ giving birth to larvae; Saspów, 14. 9. 1968 — larvae and ♀♀.

The species, new to the Polish fauna, lives in xerothermic epilithic swards. So far known only from Great Britain (WILLIAMS, 1962).

**\*11. *Euripersia europaea* (NEWSTEAD)**

host: *Poa compressa* L., on roots

loc.: relict rock south of Czajowice, 3. 9. 1968 — young ♀♀.

The species, new to the Polish fauna, lives in xerothermic epilithic swards. It occurs in Great Britain, Holland, and Germany (WILLIAMS, 1962).

**12. *Heterococcus pulverarius* (NEWSTEAD)**

host: *Agrostis vulgaris* WITH., in leaf sheaths

loc.: forest near Czajowice, 20. 7. 1966 — ♀♀ after laying eggs.

This species has been recorded from the Pieniny Mts. (KOTEJA and ŽAK-OGAŻA, 1966, as *Heterococcus variabilis* SCHMUTTERER) and Nida Valley (KOMOSIŃSKA and PODSIADŁO, 1967). It occurs in Great Britain, Germany and Holland (WILLIAMS, 1962).

**\*13. *Matadenopus festucae* ŠULC**

host: *Festuca* sp., in leaf sheaths

loc.: Grodzisko (b), 5. 7. 1968 — larvae.

The species new to the Polish fauna. In addition to Ojców, it was also collected in the regions of Cracow and Olkusz. It occurs in France, Czechoslovakia, Ukraine, and Crimea (BORCHSENIUS, 1949).

#### 14. *Paroudablis piceae* (LÖW)

host: *Picea excelsa* (LAM.) LK.

loc.: forest near Czajowice, 20. 7. 1966 — ♀♀, Ojców, 29. 7. 1966 — ♀♀.

This species, common in Poland, has already been recorded from the O.N.P. It also occurs in other European countries.

#### 15. *Phenacoccus aceris* (SIGNORET)

host: *Corylus avellana* L., *Tilia platyphyllos* SCOP., *Acer platanoides* L., *Aesculus hippocastanum* L.

loc.: forest near Czajowice, 20. 7. 1966 — old ♀♀; Skały Panieńskie, 29. 7. 1966 — old ♀♀; Saspowska Valley, 28. 6. 1967 — ♀♀ after laying eggs; Grodzisko, 5. 7. 1968 — old ♀♀.

Common species, widely distributed.

#### \*16. *Rhodania porifera* GOUX

host: *Festuca pallens* HOST., on roots

loc.: Pieskowa Skała, 10. 9. 1966 — young ♀♀.

The species, new to the Polish fauna, lives in xerothermic epilithic swards. It is known from France (GOUX, 1934), Germany (SCHMUTTERER, 1952) and U.S.S.R. (Ukraine, Crimea, Georgia, and Orenburg and Aktyubinsk Districts) (BORCHSENIUS, 1949).

#### 17. *Saccharicoccus penium* WILLIAMS

host: *Agrostis vulgaris* WITH., *A.* sp., *Festuca* sp.; in leaf sheaths

loc.: forest over the Korytania Gorge, 21. 8. 1967 — larvae and ♀♀; Ojców, 7. 9. 1967 — ♀♀ before laying eggs; Młynicka Valley (c), 22. 8. 1968 — parasitized ♀♀.

Species collected at the edges of forests, in meadows and pastures. It has been recorded from Poland by KOTEJA (1969). It is, besides, known only from Great Britain (WILLIAMS, 1962).

#### 18. *Trionymus perrisii* (SIGNORET)

host: *Festuca ovina* L., *Agrostis vulgaris* WITH., *Poa* sp., *Siglingia decumbens* (L.) LAM. and other unidentified grasses; in leaf sheaths.

loc.: Góra Koronna and Okopy, 26. 9. 1966 — ♀♀ before laying eggs; Pieskowa Skała, 10. 9. 1966 — ♀♀ before laying eggs; Saspowska Valley, 19. 8. 1967 — ♀♀; forest over the Korytania Gorge, 21. 8. 1967 — ♀♀; Smardzowski Gorge, 7. 9. 1967 — ♀♀; Grodzisko, 5. 7. 1968 — parasitized ♀♀; Młynicka Valley, 22. 8. 1968 — ♀♀ after laying eggs; relict rock south of Czajowice, 3. 9. 1968 — ♀♀ before laying eggs.

Numerous localities of this species have been found in Poland by KOTEJA (1969). It occurs in Europe and Transcaucasia.

### 19. *Trionymus tomlini* GREEN

host: *Festuca ovina* L., in leaf sheaths of grasses

loc.: Mlynicka Valley (c), 22. 8. 1968 — young ♀♀.

The species has been reported from Poland by KOTEJA (1969). It occurs in Great Britain (WILLIAMS, 1962).

### Family: *Eriococcidae*

### 20. *Acanthococcus greeni* (NEWSTEAD)

host: unidentified grass

loc.: Grodzisko (a), 11. 7. 1968 — ♀ while laying eggs; relict rock south of Czajowice, 3. 9. 1968 — ♀ in ovisac.

This species has already been recorded from the Pieniny Mts. in Poland (ŻAK-OGAŻA and KOTEJA, 1964), it occurs in other European countries.

### 21. *Cryptococcus fagisuga* LINDINGER

host: *Fagus silvatica* L.

loc.: it occurs all over the O.N.P.

It has already been recorded from the O.N.P. (KAWECKI, 1935). It is common in Poland and widely distributed within the range of the beech.

### 22. *Fonscolombia fraxini* (KALTENBACH)

host: *Fraxinus excelsior* L.

loc.: forest near Czajowice, 20. 7. 1966 — old ♀♀; Saspowska Valley, 28. 6. 1967 — numerous ♀♀; Pieskowa Skała, 23. 7. 1968 — old ♀♀.

Holarctic species common in Poland.

### 23. *Greenisca brachypodii* BORCHSENIUS, DANZIG

host: *Brachypodium pinnatum* (L.) P.B.

loc.: Grodzisko (a), 11. 7. 1968 — numerous ♀♀ before and while forming ovisacs; Pieskowa Skała, 23. 7. 1968 — ♀♀ in ovisacs; Młynik (a), 22. 8. 1968 — ♀♀ in ovisacs.

Species inhabiting rocky debris exposed to the sun's rays and with developing vegetation. It has been recorded from the Pieniny Mts. by KOTEJA and ŻAK-OGAŻA (1966). It occurs in the U.S.S.R. (Kazakhstan, Lithuania, Leningrad District) (BORCHENIUS and DANZIG, 1966).



**24. *Greenisca glyceriae* (GREEN)**

host: *Poa compressa* L., *Festuca* sp., in leaf sheaths.

loc.: Grodzisko (b), 5. 7. 1968 — ♀; relict rock south of Czajowice, 3. 9. 1968 — ♀♀ after laying eggs.

Species collected in several localities in south Poland, present in other parts of Europe.

**\*25. *Greenisca gouxi* (BALACHOWSKY)**

host: *Brachypodium pinnatum* (L.) P.B.

loc.: Grodzisko (a), 11. 7. and 11. 9. 1968 — numerous young ♀♀ before laying eggs and ♀♀ after laying eggs; Młynik (a), 22. 8. 1968 — ♀♀ in ovisacs before laying eggs.

The species new to the Polish fauna occurs in association with *Greenisca brachypodii*. Present in France (BALACHOWSKY, 1954) and Abchasia (BORCHSENIUS and DANZIG, 1966).

**26. *Rhizococcus herbaceus* DANZIG**

host: *Luzula campestris* (L.) DC., unidentified grasses

loc.: forest near Czajowice, 20. 7. 1966 — ♀♀ at the time of egg laying; Złota Góra, 10. 9. 1966 — ♀♀ after laying eggs.

Species noted in south Poland. It occurs in the Leningrad District and probably in Germany (DANZIG, 1962).

**\*27. *Rhizococcus inermis* (GREEN)**

host: *Festuca ovina* L.

loc.: Młynicka Valley (c), 22. 8. 1968 — ♀♀ at the time of egg laying.

The species, new to Poland, occurs in England, France and U.S.S.R. (DANZIG, 1962).

**28. *Rhizococcus insignis* (NEWSTEAD)**

host: *Festuca ovina* L., *Agrostis* sp., *Poa* sp.

loc.: Saspowska Valley (b), 28. 6. 1967 — ♀♀ during and after egg laying; Grodzisko (b), 5. 7. 1968 — ♀♀ in ovisacs; Młynicka Valley (b), 22. 8. 1968 — ♀♀ before laying eggs.

Species collected in several localities in south Poland and widely distributed in Europe.

**\*29. *Rhizococcus pseudinsignis* (GREEN)**

host: *Calamagrostis* sp., *Agrostis vulgaris* WITH., *Festuca* sp., *Brachypodium pinnatum* (L.) P.B., other unidentified grasses.

loc.: forest near Czajowice, 20. 7. 1966 — ♀♀ before and during egg laying; Dąbrówka, 19. 8. 1967 — ♀♀ after laying eggs; Prądnik Valley, 21. 8. 1967 — ♀♀ in ovisacs before laying eggs; Grodzisko (b and a), 5. 7. and 11. 7. 1968 — ♀♀ in ovisacs after laying eggs, larvae in the first instar (second generation); Mlynik (b), 22. 8. 1968 — ♀♀ after laying eggs; relict rock south of Czajowice, 3. 9. 1968 — ♀♀ after laying eggs.

Species, new to the Polish fauna, often found together with *Rh. insignis*. It occurs in Europe and in the Caucasus Mts. (DANZIG, 1962).

**Family: *Kermococcidae***

**30. *Kermococcus quercus* (L.)**

host: *Quercus robur* L.

loc.: Mlynicka Valley (c), 22. 8. 1968 — old ♀♀.

The species is common in south Poland but rare in the study area. It occurs in west, north and central Europe, in Crimea and Caucasus (BORCHSENIUS, 1960).

**Family: *Asterolecaniidae***

**31. *Asterodiaspis quercicola* (BOUCHÉ)**

host: *Quercus robur* L.

loc.: forest near Czajowice, 20. 7. 1966 — ♀♀ after laying eggs and larvae in the first instar; Góra Koronna and Okopy, 26. 9. 1966 — ♀♀; forest over the Korytania Gorge, 21. 8. 1967 — ♀♀; Pieskowa Skała, 23. 7. 1968 — ♀♀.

This is a cosmopolitan species (BORCHSENIUS, 1960) recorded from Poland by BORATYŃSKI (1961).

**32. *Planchonia arabidis* SIGNORET**

host: *Origanum vulgare* L.

loc.: Grodzisko (b), 5. 7. 1968 — larvae and young ♀♀.

Palearctic species; in Poland found in the Nida Valley (KOMOSIŃSKA and PODSIADŁO, 1967).

Family: *Coccidae***33. *Eriopeltis festucae* (FONSCOLOMBE)**

host: *Agrostis* sp. and other grasses

loc.: Saspowska Valley (b), 28. 6. 1967 — ♀♀ before laying eggs; Prądnik Valley, 21. 8. 1967 — young ♀♀ (second generation).

Species common in Poland. It occurs in the Palaearctic.

**34. *Eulecanium coryli* (L.)**

host: *Corylus avellana* L., *Tilia parvifolia* EHRH., *Acer pseudoplatanus* L., *Ulmus scabra* MILL.

loc.: Góra Koronna and Okopy, 26. 9. 1966 — larvae in the second instar and old ♀♀; Saspowska Valley, 28. 6. and 19. 8. 1967 — old ♀♀.

Common Palaearctic species.

**\*35. *Lecanopsis festucae* BORCHSENIUS**

host: *Poa compressa* L., on root necks

loc.: relict rock south of Czajowice, 3. 9. and 11. 8. 1968 — larvae of the second and third instars.

The species, new to Poland, inhabits xerothermic epilithic swards. It occurs in the Ukraine, Crimea, North Caucasus (BORCHSENIUS, 1952) and Hungary (ŻAK-OGAZA, 1966).

**\*36. *Lecanopsis formicarum* NEWSTEAD**

host: host not determined, in the sod

loc.: Saspowska Valley, 28. 6. 1967 — larvae in various instars and ♀♀ before and after laying eggs.

Species new to Poland. In addition to the O.N.P., it has been found in the Pieniny Mts. (forest clearing below Ociemny Wierch, 7. 6. 1964., leg. S. OGAZA) and in the Cracow region. It occurs only in Europe.

**37. *Luzulaspis luzulae* (DUFOUR)**

host: *Luzula campestris* (L.) D.C., *L. pilosa* (L.) WILLD.

loc.: Saspowska Valley, 28. 6. and 19. 8. 1967 — ♀♀ during and after egg laying; Prądnik Valley, 21. 8. 1967 — ♀♀ after laying eggs; Smardzowski Gorge, 7. 9. 1967 — young ♀♀ of second generation; Grodzisko (a), 11. 7. 1968 — ♀♀ at the time of egg laying; Młynicka Valley, 11. 9. 1968 — ovisacs.

Species occurring in meadows and pastures; common in Poland, known from the Palaearctic.



### 38. *Luzulaspis nemorosa* KOTEJA

host: *Luzula nemorosa* (POLL.) E. MEY

loc.: forest near Czajowice, 20. 7. 1966 — ♀♀ before laying eggs; Złota Góra and Dąbrówka, 19. 8. 1967 — ♀♀ after laying eggs; forest over the Korytania Gorge, 21. 8. 1967 — ♀♀ at the time of and after egg laying; Góra Koronna and Okopy, 25. 9. 1967 — ovisacs; Pieskowa Skała, 23. 7. 1968 — ♀♀ while laying eggs; Młynicka Valley (c), 22. 8. 1968 — ♀♀ during and after egg laying.

Species living in forests, especially at their edges; common in southern Poland, known from Europe.

### \*39. *Parafairmairia gracilis* GREEN

host: *Carex digitata* L.

loc.: Za Bramą Krakowską Gorge, 13. 7. 1966 — larvae and young ♀♀; Góra Koronna and Okopy, 25. 9. 1966 and 26. 9. 1967 — ♀♀ after laying eggs; Grodzisko (c), 11. 9. 1968 — ♀♀ after laying eggs.

Species collected in moist and xerothermic epilithic swards. It is new to the Polish fauna<sup>1</sup>, occurs in other parts of Europe.

### 40. *Parthenolecanium corni* (BOUCHÉ)

host: *Helianthemum ovatum* (VIV.) DUN., *Cornus mas* L., *Corylus avellana* L., *Prunus spinosa* L., *Rosa* sp., *Carpinus betulus* L., *Tilia parvifolia* EHRH., *Malus* sp.

loc.: Góra Koronna, 26. 9. 1966 — larvae in the second instar and old ♀♀; Saspowska Valley, 28. 6. 1967 — ♀♀ and male puparia; Grodzisko, 11. 7. 1968 — larvae in the first instar and old ♀♀; 11. 9. 1968 — larvae in the second instar and old ♀♀; Pieskowa Skała, 23. 7. 1968 — old ♀♀; Młynicka Valley, 22. 8. 1968 — old ♀♀.

This common cosmopolitan species has already been recorded from the O.N.P. (KAWECKI, 1935).

### 41. *Phyllostroma myrtilli* (KALTENBACH)

host: *Vaccinium myrtillus* L.

loc.: Za Bramą Krakowską Gorge, 13. 7. 1966 — ovisacs with eggs and larvae in the first instar; Złota Góra, 19. 8. 1967 — larvae; Góra Koronna and Okopy, 25. 9. 1967 — larvae in the second instar.

Species known from several localities in Poland. It occurs in other countries of Europe.

<sup>1</sup> In his discussion of the distribution of this species ŘEHÁČEK (1960) mentions also Poland without giving any details.

**42. *Physokermes hemicryphus* (DALMAN)**

host: *Picea excelsa* (LAM.) LK., *Abies alba* MILL.

loc.: forest near Czajowice, 20. 7. 1966; Ojców, 29. 7. 1966, Saspowska Valley, 28. 6. 1967; Złota Góra, 19. 8. 1967; Młynik, 22. 8. 1968. Old ♀♀ were taken in all these localities.

Species common in Poland and Europe.

**43. *Pysokermes piceae* (SCHRANK)**

host: *Picea excelsa* (LAM.) LK.

loc.: Młynicka Valley, 22. 8. 1968 — old ♀♀.

Species known from several localities in Poland and occurring in small populations. It is widely distributed in Europe. It has already been recorded from the O.N.P. (KAWECKI, 1935).

**44. *Pulvinaria betulae* (L.)**

host: *Corylus avellana* L.

loc.: Saspowska Valley, 28. 6. 1967 — larvae of the first instar and ♀♀.

Common and widely distributed species.

**45. *Sphaerolecanium prunastri* (FONSCOLOMBE)**

host: *Prunus spinosa* L.

loc.: Grodzisko, 5. 7. 1968 — ♀♀ while laying eggs.

Species rather common in southern Poland. It occurs in the Palaearctic.

**Family: *Diaspididae***

**46. *Anamaspis loewi* (COLVÉE)**

host: *Pinus silvestris* L.

loc.: Za Bramą Krakowską Gorge, 13. 7. 1966; Góra Koronna and Okopy, 26. 9. 1966 and 25. 9. 1967. Old ♀♀ were collected in both localities.

Species common in Poland and occurring in Europe and Transcaucasia.

**47. *Carulaspis juniperi* (BOUCHÉ)**

host: *Juniperus communis* L.

loc.: Skały Panińskie, 29. 7. 1966 — old ♀♀; Góra Koronna and Okopy, 26. 9. 1966 and 25. 9. 1967 — ♀♀.

Cosmopolitan species known from several localities in Poland.

#### 48. *Chionaspis salicis* (L.)

host: *Vaccinium myrtillus* L., *Salix caprea* L., *Salix* sp., *Populus tremula* L., *Alnus glutinosa* (L.) GDERNT., *Tilia parvifolia* EHRH.

loc.: forest near Czajowice, 20. 7. 1966; Góra Koronna and Okopy, 26. 9. 1966; Złota Góra, 19. 8. 1967; forest over the Korytania Gorge, 21. 8. 1967; Grodzisko, 11. 7. 1968; Młynik, 22. 8. 1968; Old ♀♀ were collected in all these localities.

This Palaearctic and common species has already been recorded from the O.N.P. (KAWECKI, 1935).

#### 49. *Lepidosaphes ulmi* (L.)

host: *Vaccinium myrtillus* L., *Calluna vulgaris* (L.) SALISB., *Prunus spinosa* L., *Malus* sp., *Crataegus* sp., *Quercus robur* L.

loc.: common all over the O.N.P.

This common cosmopolitan species has already been recorded from the O.N.P. (KAWECKI, 1935).

#### 50. *Nuculaspis abietis* (SCHRANK)

host: *Picea excelsa* (LAM.) LK., *Abies alba* MILL.

loc.: Za Bramą Krakowską Gorge, 13. 7. 1966; forest near Czajowice, 20. 7. 1966; Góra Koronna and Okopy, 26. 9. 1966; Dąbrówka, 19. 8. 1967; Młynik, 22. 8. 1968. Young and old ♀♀ were taken in all these localities.

Species common in Poland and known from Europe, Transcaucasia, Turkey and Algeria (BORCHSENIUS, 1966).

#### 51. *Quadraspidotus bavaricus* (LINDINGER)

host: *Calluna vulgaris* (L.) SALISB.

loc.: Saspowska Valley (a), 19. 8. 1967 — ♀♀; Młynicka Valley (c), 22. 8. 1968 — ♀♀.

The species is fairly often collected in Poland and occurs in Europe.

#### 52. *Quadraspidotus ostreaeformis* (CURTIS)

host: *Salix* sp.

loc.: Grodzisko, 11. 9. 1968 — numerous larvae and ♀♀.

The common cosmopolitan species has already been recorded from the O.N.P. (KAWECKI, 1935).



53. *Quadraspidiotus zonatus* (FRAUENFELD)

host: *Quercus robur* L.

loc.: Góra Koronna and Okopy, 26. 9. 1966 — ♀♀ and male puparia.

Species known from several localities in Poland. It occurs in Europe, Asia Minor and North Africa (BORCHSENIUS, 1966).

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W latach 1966—68 przeprowadzono badania nad fauną czerwców Ojcowskiego Parku Narodowego. Poprzednio z tego terenu było opublikowanych 8 gatunków czerwców (KAWECKI, 1935), obecnie wykazano 53 gatunki, z czego 11 jest nowych dla fauny Polski. Są to: *Chaetococcus sulci*, *Chnaurococcus subterraneus*, *Euripersia europaea*, *Greenisca gouxii*, *Lecanopsis festucae*, *L. formicarum*, *Metadenopus festucae*, *Parafairmairia gracilis*, *Rhizococcus inermis*, *Rh. pseud-insignis*, *Rhodania porifera*.

Liczba 53 gatunków jest bardzo wysoka zważywszy małą powierzchnię badanego terenu, stanowi bowiem ponad 50% gatunków znanych w Polsce. Ta duża liczba gatunków wynika zapewne ze specyfiki terenu. Urozmaicona rzeźba, zróżnicowanie mikroklimatów, niezwykle bogata szata roślinna — wszystkie te czynniki niewątpliwie przyczyniły się do występowania bogatej fauny czerwców.

Spróbowano uszeregować czerwce w grupy ekologiczne, odpowiadające występującym na terenie OPN zbiorowiskom roślinnym. Jak zwykle, z uwagi na polifagiczny charakter większości gatunków czerwców, przeprowadzenie takiej analizy było bardzo trudne, niemniej stwierdzono, że niektóre gatunki są charakterystyczne dla określonych zbiorowisk roślinnych.

Największą i najbardziej charakterystyczną grupę stanowią czerwce związane z murawą naskalną (*Festucetum pallentis*), inicjalnymi i degradacyjnymi stadiami zarośli kserotermicznych (*Origano-Brachypodietum pinnati* prov.) i ciepłymi zaroślami (*Corylo-Peucedanetum cervariae*). Czerwce związane z tymi środowiskami zostały ujęte w grupę A. Zaliczono tutaj 16 gatunków, z których aż 9 jest nowych dla fauny Polski.

Drugą grupę stanowią czerwce występujące na łąkach i pastwiskach, przydrożach i obrzeżach lasów. Związane są z zespołami roślinnymi — *Caltion*, *Arrhenatheretum elatioris*, *Lolio-Cynosuretum* i zbiorowiskami z *Agrostis vulgaris*. Do tej grupy (B) zaliczono 13 gatunków, z których 2 są nowe dla fauny Polski. Najwięcej czerwców, jeżeli chodzi o ilość gatunków jak i liczebność populacji, zebrano na przydrożach i obrzeżach lasów.

Trzecią grupę (C) stanowią gatunki leśne. Grupa ta obejmuje tylko 13 gatunków, mimo że zespoły leśne na terenie OPN są bardzo różnorodne i zajmują stosunkowo dużą powierzchnię. Większość gatunków występuje w górnych partiach lasów, na wierzcholinie lub na czubach skał. Lasy na zboczach są prawie pozbawione czerwców. Prawie wszystkie zebrane gatunki są dosyć pospolite i spotykane na całym terenie Polski.

I wreszcie czwartą grupę (D) stanowią czerwce żyjące w różnych środowiskach, w większości polifagi — gatunki pospolite. Zaliczono tutaj 11 gatunków.

Na mapie (Fig. 1) podano rozmieszczenie gatunków nowych dla fauny Polski (cyfry arabskie), oraz cyframi rzymskimi zaznaczono lokalizację sta-



nowisk, na których przeprowadzono dokładne badania faunistyczne. W charakterystyce poszczególnych stanowisk podano ich ekspozycję i zbiorowiska roślinne.

Lista gatunków jest przeglądem wszystkich omawianych czerwców. Przy poszczególnych gatunkach podano ich żywicieli, daty zebrania i stadia rozwojowe. W wielu przypadkach te dane biologiczne są uzupełnieniem wiadomości dla mało znanych gatunków.

#### РЕЗЮМЕ

В 1966—1968 гг. проведены исследования над фауной кокцид Ойцовского Народного Парка. В этой местности было известно до сих пор 8 видов кокцид (КАВЕСКИ, 1935). В настоящее время обнаружено 53 вида, из которых 11 новые для фауны Польши. Это: *Chaetococcus sulci*, *Chnaurococcus subterraneus*, *Euripersia europaea*, *Greenisca gouxii*, *Lecanopsis festucae*, *L. formicarum*, *Metadenopus festucae*, *Parafairmairia gracilis*, *Rhizococcus inermis*, *Rh. pseudinsignis*, *Rhodania porifera*.

Принимая во внимание небольшую поверхность исследованной местности, 53 найденных здесь вида представляют собой довольно внушительное число, это составляет 50% всех видов известных в Польше. Такое большое количество видов связано, по всей вероятности, со спецификой местности. Разнообразие рельефа местности, дифференцирование микроклимата, необычайно богатый растительный покров — все эти факторы несомненно повлияли на наличие богатой фауны кокцид.

Сделана попытка деления кокцид на экологические группы, соответствующие растительным сообществам Ойцовского Народного Парка. Ввиду того, что большинство видов кокцид является полифагами, проведение такой „классификации“ было очень трудным. Однако удалось установить, что некоторые виды являются характерными для определённых растительных сообществ.

Самую большую и наиболее характерную группу составляют кокциды, связанные с *Festucetum pallentis*, инициальными и деградационными стадиями ксеро-термических зарослей *Origano-Brachypodietum pinnati prov.* и термофильными зарослями *Corylo-Peucedanetum cervariae*. Кокциды, связанные с этими сообществами, отнесены к группе А. Здесь насчитано 16 видов, из них 9 новых для фауны Польши.

Ко второй группе отнесены кокциды, встречающиеся на лугах и пастбищах, придорожных зарослях и лесных опушках. Они связаны со следующими растительными ассоциациями *Calthion*, *Arrhenatheretum elatioris*, *Lolio-Cynosuretum* и растительными сообществами с *Agrostis vulgaris*. К группе (В) причислено 13 видов, из них 3 новые для фауны Польши. Наибольшее число кокцид по видовому и количественному составу собрано в придорожных зарослях и на лесных опушках.

Третью группу (С) составляют лесные виды. Эта группа охватывает только 13 видов, несмотря на то, что лесные ассоциации в Ойцовском Народном Парке очень неоднородны и занимают сравнительно большую поверхность. Большинство видов встречается в верхних партиях лесов на возвышенных плато или вершинах скал. В лесах на склонах кокциды почти не встречались. Почти все собранные виды довольно обычны и встречаются на территории всей Польши.

Наконец четвёртая группа (D) охватывает кокциды, обитающие в различных средах. В большинстве случаев это обыкновенные виды полифаги. К данной группе отнесено 11 видов.

На карте (фиг. 1) представлено размещение новых видов фауны Польши (арабские цифры) и места, в которых проведены точные фаунистические исследования (римские цифры). В характеристике отдельных мест представлена их экспозиция и растительные сообщества.

Перечень видов является просмотром всех рассматриваемых кокцид. В описании отдельных видов приведены названия растений, на которых данный вид обитает, дата сбора и стадия развития. В ряде случаев эти биологические данные являются дополнительными сведениями о мало известных видах.

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